

CLAIMS

I claim:

1. A method of providing cardiac support comprising the steps of:

5 a. selecting a blood flow apparatus including a generally coaxially aligned and slideably arranged inner conduit and outlet conduit, and a blood pump disposed therebetween, the blood pump capable of pumping blood through a body;

10 b. forming a portal in a blood vessel or heart chamber;

c. securing the outer conduit within the portal;

15 d. inserting the inner conduit through the outer conduit so that the distal opening of the inner cannula is disposed on an opposite side of a desired heart valve as the distal opening of the outer conduit; and

20 e. activating the pump so that blood is pumped into the distal opening of one of the inner conduit and outer conduit and transported out of the distal opening of the other of the inner conduit and outer conduit.

2. The method of claim 1 and further, wherein the blood pump is a reverse axial flow blood pump.

25 3. The method of claim 1 and further, wherein the distal openings of the inner and outer conduits are positioned on either side of the pulmonic valve and the pump operated to provide right-heart cardiac support.

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4. The method of claim 1 and further, wherein the distal openings of the inner and outer conduits are positioned on either side of the aortic valve and the pump operated to provide left-heart cardiac support.

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5. A method of treating heart tissue during cardiac surgery, comprising the steps of:

a. providing a cannula dimensioned to extend into a heart chamber during cardiac surgery;

10 b. equipping the cannula with at least one inflatable member; and

c. providing a fluid source capable of inflating the inflatable member.

15 6. The method of claim 5 and further, wherein the fluid source comprises a fluid having coolant properties to cool the adjacent heart tissue upon inflation of the inflatable member.

20 7. The method of claim 5 and further, wherein the inflatable member has at least one perforation and the fluid source comprises a fluid having medicament properties such that medication may be delivered to the adjacent heart tissue upon inflation of the inflatable member.

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8. The method of claim 5 and further, wherein the cannula is equipped with a first inflatable member at a first location along the cannula and a second inflatable member at a second location along the cannula.

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9. The method of claim 8 and further, wherein the first and second inflatable members are disposed on either side of at least one heart valve and inflated to seal off the blood flow along the exterior of the cannula between the first and second location.

10. The method of claim 9 and further, wherein the first inflatable member is positioned downstream from the aortic valve, the second inflatable member is positioned upstream from the mitral valve, and the first and second inflatable members inflated such that blood from the left atrium passes through the interior of the cannula for delivery into the aorta.

11. The method of claim 10 and further, wherein the flow of blood from the left atrium into the aorta is facilitated by a blood pump.

12. A system for providing cardiac support during surgery, comprising:

a. a blood pump having an inlet port and an outlet port;

b. a first conduit having a proximal opening and a distal opening, the proximal opening coupled to the inlet port of the blood pump, and the first conduit being dimensioned such that the distal opening may extend into a heart chamber or vessel;

- 5 c. a second conduit having a proximal opening and a distal opening, the proximal opening coupled to the outlet port of the blood pump, and the second conduit disposed generally coaxially relative to the first conduit and dimensioned such that the distal opening of the second conduit is spaced-apart from the distal end of the first conduit within the heart or vessel;
- 10 d. at least one inflatable member disposed along at least one of the first conduit and the second conduit; and
- e. a fluid source capable of inflating the inflatable member.

15 13. The system of claim 12 and further, wherein the fluid source comprises a fluid having coolant properties to cool the adjacent heart tissue upon inflation of the inflatable member.

20 14. The system of claim 12 and further, wherein the inflatable member has at least one perforation and the fluid source comprises a fluid having medicament properties such that medication may be delivered to the adjacent heart tissue upon inflation of the inflatable member.

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15. The system of claim 12 and further, wherein the first conduit is equipped with a first inflatable member at a first location and a second inflatable member at a second location.

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16. The system of claim 15 and further, wherein the first and second inflatable members are disposed on either side of at least one heart valve and inflated to seal off the blood flow along the exterior of the first conduit between the first and second location.

17. The system of claim 16 and further, wherein the first inflatable member is positioned downstream from the aortic valve, the second inflatable member is positioned upstream from the mitral valve, and the first and second inflatable members inflated such that blood from the left atrium passes through the interior of the first conduit for delivery into the aorta.

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